

Attorney Docket No. IMMR-004/01US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Lonny L. CHU

Serial No.: Unassigned

Examiner: TBD

Confirmation No.: Unassigned

Art Unit: TBD

Filed: Herewith

For: **SOUND DATA OUTPUT AND MANIPULATION USING HAPTIC FEEDBACK**

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**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. §1.97(b)**

In accordance with the duty of disclosure set forth in 37 C.F.R. §1.56, Applicant(s) hereby submits the following information in conformance with 37 C.F.R. §§1.97 and 1.98.

- ☐ Pursuant to 37 C.F.R. §1.98, a copy of each document cited in the attached Form PTO/SB/08 is enclosed.
- ☒ No copies of the publications listed on the attached Form PTO/SB/08A are being provided pursuant to 37 C.F.R. §1.98(d) because the publications were previously cited by or submitted to the Office in prior Application Serial No. 09/975,320 to which the above-identified application claims priority under 35 U.S.C. §120.
- ☐ No copies of any U.S. patents or U.S. patent application publications listed on the attached Form PTO/SB/08A are being provided pursuant to 37 C.F.R. §1.98 because this application was filed after June 30, 2003.
- ☐ Publication(s) ___ listed on the attached Form PTO/SB/08A were cited in a foreign search or examination report corresponding to ___ application serial no. and mailed on ___.
- ☐ Enclosed is a copy of a non-English publication(s) ___. Pursuant to §609 of the M.P.E.P., Applicant submits the attached foreign search or examination report, which cites such non-English language publication(s).
- ☐ Enclosed is a copy of a non-English publication(s) ___. English language publication ___ (copy enclosed) claims priority from this non-English publication.

- ☐ Enclosed is an explanation of non-English publication(s) ___ for which an English translation is not available.
- ☐ Enclosed is an English translation of non-English publication(s) ___ cited in the attached Form PTO/SB/08A.
- ☐ Enclosed is a copy of pending patent Application Serial No. _____.

This Information Disclosure Statement is filed within any one of the following time periods:

- ☒ within three months from the filing date of this national application other than a CPA under 37 C.F.R. § 1.53(d);
- ☐ within three months from the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in this international application;
- ☐ before the mailing date of a first office action on the merits; or
- ☐ before the mailing of a first office action after the filing of a request for continued examination under 37 C.F.R. § 1.114.

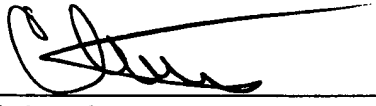
It is respectfully requested that the Examiner consider the above-noted information and return an initialed copy of the attached Form PTO/SB/08A to the undersigned.

Dated: February 20, 2004

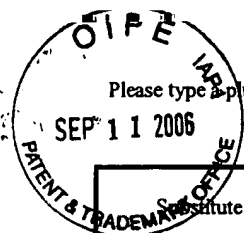
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Reg. No. 41,087



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PTO/SB/08A (08-00)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)			Complete if Known		
			Application Number	Unassigned	
			Filing Date	February 20, 2004	
			First Named Inventor	Lonny L. CHU	
			Group Art Unit	Unassigned	
Examiner Name	Unassigned				
Sheet	1	of	4	Attorney Docket Number	IMMR-004/01US

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code ² (if known)		
	A1	6,300,936		Braun et al.	10/09/2001
	A2	6,292,170		Chang et al.	09/18/2001
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	A8	6,131,097		Peurach et al.	10/10/2000
	A9	6,088,017		Tremblay et al.	07/11/2000
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	A12	5,959,613		Rosenberg et al.	09/28/1999
	A13	5,889,672		Schuler et al.	03/30/1999
	A14	5,857,986		Moriyasu	01/12/1999
	A15	5,844,392		Peurach et al.	12/01/1998
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	A18	5,785,630		Bobick, et al.	07/28/1998
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	A23	5,619,180		Massimino et al.	04/08/1997
	A24	5,565,840		Thorner et al.	10/15/1996
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	A26	5,466,213		Hogan et al.	11/14/1995
	A27	5,405,152		Katanics et al.	04/11/1995
	A28	5,399,091		Mitsumoto	03/21/1995
	A29	5,388,992		Franklin et al.	02/14/1995
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	A35	5,240,417		Smithson et al.	08/31/1993
	A36	5,212,473		Louis	05/18/1993
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	A38	5,189,355		Larkins et al.	02/23/1993
	A39	5,186,629		Rohen	02/16/1993
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	A42	5,035,242		Franklin et al.	07/30/1991

¹ Unique citation designation number.

² See attached Kinds of U.S. Patent Documents.

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Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

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Sheet	2	of	4	Application Number	Unassigned
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				Group Art Unit	Unassigned
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A43	5,022,407	Horch et al.	06/11/1991
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A45	4,937,685	Barker et al.	06/26/1990
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	B1		0 349 086	A1	Stork Kwant B.V.	01/03/1990	
	B2		WO 95/02233		Cybernet Systems Corp.	01/19/1995	
	B3		WO 02/27705			04/04/2002	

¹ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).² For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.³ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.⁴ Applicant is to place a check mark here if English language Translation is attached.

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			Group Art Unit	Unassigned
			Examiner Name	Unassigned
			Attorney Docket Number	IMMR-004/01US

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	C1	Balgrie, "Electric Control Loading - A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990	
	C2	Iwata, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp. 287-292, 1993	
	C3	Russo, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," <i>MIT Libraries Archives</i> pp. 1-131, May 1990, archived 8/14/90	
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	C5	Jones et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); <i>Experimental Brain Research</i> , Vol. 79, No. 1, pp. 150-156, 1990	
	C6	Burdea et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," <i>1993 IEEE International Conference on Robotics and Automation</i> , pp. 25-44, 05/02/1993	
	C7	Snow et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. NPO-17851; JPL Case No. 7348, pp. 1-4 with 45 pages of attachments, 06/15/1989	
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	C9	Tadros, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators," <i>MIT Archive</i> , pp. 1-88, February 1990, archived 8/13/90	
	C10	Caldwell et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993	
	C11	Adelstein et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992	
	C12	Gotow et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337	
	C13	Stanley et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992	
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	C17	Adelstein, "A Virtual Environment System For The Study of Human Arm Tremor," <i>Ph.D. Dissertation</i> , Dept. of Mechanical Engineering, MIT, June 1989, archived 3/13/90	
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	C19	Bejczy et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981	
	C20	McAfee et al., "Teleoperator Subsystem/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," <i>JPL 1988</i> , JPL D-5172	
	C21	Minsky, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," <i>Ph.D. Dissertation</i> , MIT, June 1995, archived 7/6/95	
	C22	Jacobsen et al., "High Performance, Dexterous Telerobotic Manipulator With Force Reflection," <i>Intervention/ROV '91 Conference & Exposition</i> , Hollywood, Florida, May 21-23, 1991	
	C23	Shimoga, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," <i>Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration</i> , Rensselaer Polytechnic Institute, Sep. 30- Oct. 1, 1992	
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	C25	Terry et al., "Tactile Feedback In A Computer Mouse," <i>Proceedings of Fourteenth Annual Northeast Bioengineering Conference</i> , University of New Hampshire, March 10-11, 1988	
	C26	Howe, "A Force-Relating Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992	

Examiner Signature	Date Considered
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	C27	Eberhardt et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," <i>IEEE Virtual Reality Annual International Symposium</i> , Seattle, WA, Sep. 18-22, 1993	
	C28	Rabinowitz et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contractor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987	
	C29	Bejczy et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," <i>International Computer Technology Conference, The American Society of Mechanical Engineers</i> , San Francisco, CA, August 12-15, 1980	
	C30	Bejczy et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," <i>SOAR '89 Workshop, JSC</i> , Houston, TX, July 25-27, 1989	
	C31	Ouhyoung et al., "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," <i>IEEE Transactions on Consumer Electronics</i> , Vol. 41, No. 3, August 1995	
	C32	Marcus, "Touch Feedback in Surgery," <i>Proceedings of Virtual Reality and Medicine The Cutting Edge</i> , Sep. 8-11, 1994	
	C33	Bejczy, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987	
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	C35	Gillespie, B., "The Virtual Piano Action: Design and Implementation," <i>Proc. of Int'l Computer Music Conf.</i> September 1994, pp. 167-170	
	C36	Snibbe, S. et al., "Haptic Techniques for Media Control," <i>Proc. of 14th Annual Symp. On User Interface Software and Technology, UIST 2001</i> , November 2001, pp. 1-10	
	C37	MacLean K. et al., "An Architecture for Haptic Control of Media," <i>Proc. of ASME Dynamic Systems and Control Division, Haptic Interfaces for Virtual Environments and Teleoperator Systems</i> , 1999, pp. 1-10	
	C38	O'Modhrain, M., "Playing by Feel: Incorporating Haptic Feedback into Computer-Based Musical Instruments," Dissertation, Dept. of Music, Stanford University, November 2000, pp. 1-107	

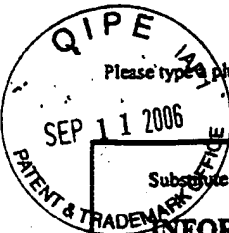
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JD	A64	3,157,853		Hirsch	11/17/1964

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Examiner Initials*	Cite No. ¹	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	T ⁴
		Office ¹	Number ²	Kind Code ³ (if known)			
JD	B1		0 349 086	A1	Stork Kwant B.V.	01/03/1990	
JD	B2		WO 95/02233		Cybernet Systems Corp.	01/19/1995	
JD	B3		WO 02/27705			04/04/2002	

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² For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

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⁴ Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature	/Jeffrey Donels/	Date Considered	05/24/2006
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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Complete if Known		
		Application Number	Unassigned	
		Filing Date	February 20, 2004	
		First Named Inventor	Lonny L. Chu	
		Group Art Unit	Unassigned	
Examiner Name	Unassigned			
Sheet	3	4	Attorney Docket Number	IMMR-004/01US

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²	
JD	C1	Balgrie, "Electric Control Loading - A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990		
JD	C2	Iwata, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp. 287-292, 1993		
JD	C3	Russe, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," <i>MIT Libraries Archives</i> pp. 1-131, May 1990, archived 8/14/90		
JD	C4	Brooks et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," <i>JPL Publication 85-11</i> , NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985		
JD	C5	Jones et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); <i>Experimental Brain Research</i> , Vol. 79, No. 1, pp. 150-156, 1990		
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JD	C9	Tadros, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators," <i>MIT Archive</i> , pp. 1-88, February 1990, archived 8/13/90		
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JD	C11	Adelstein et al., "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992		
JD	C12	Gotow et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337		
JD	C13	Stanley et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992		
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JD	C16	Patrick et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," <i>Cooperative Intelligent Robotics in Space</i> , Rui J. deFigueiredo et al, Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990		
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JD	C18	Bejczy, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," <i>Science</i> , Vol. 208, No. 4450, pp. 1327-1335, 1980		
JD	C19	Bejczy et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981		
JD	C20	McAfee et al., "Teleoperator Subsystem/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," JPL 1988, JPL D-5172		
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JD	C23	Shimoga, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," <i>Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration</i> , Rensselaer Polytechnic Institute, Sep. 30-Oct. 1, 1992		
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JD	C26	Howe, "A Force-Relating Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992		

Examiner Signature	/Jeffrey Donels/	Date Considered	05/24/2006
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		Application Number	Unassigned	
		Filing Date	February 20, 2004	
		First Named Inventor	Lonny L. Chu	
		Group Art Unit	Unassigned	
Examiner Name	Unassigned			
Sheet	4	4	Attorney Docket Number	IMMR-004/01US

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JD	C28	Rabinowitz et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contractor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987	
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JD	C30	Bejczy et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," <i>SOAR '89 Workshop, JSC</i> , Houston, TX, July 25-27, 1989	
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JD	C34	Gillespie, B., "The Touchback Keyboard," <i>Proc. of Int'l Computer Music Conf.</i> , October 1992, pp. 447-448	
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JD	C36	Snibbe, S. et al., "Haptic Techniques for Media Control," <i>Proc. of 14th Annual Symp. On User Interface Software and Technology, UIST 2001</i> , November 2001, pp. 1-10	
JD	C37	MacLean K. et al., "An Architecture for Haptic Control of Media," <i>Proc. of ASME Dynamic Systems and Control Division, Haptic Interfaces for Virtual Environments and Teleoperator Systems</i> , 1999, pp. 1-10	
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47MQ011.DOC

¹ Unique citation designation number.

² Applicant is to place a check mark here if English language Translation attached.

Examiner Signature	/Jeffrey Donels/	Date Considered	05/24/2006
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PTO/SB/08A (08-00)



Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		Application Number	10/781,918
		Filing Date	February 20, 2004
		First Named Inventor	Lonny L. CHU
		Group Art Unit	Unassigned
		Examiner Name	Unassigned
Sheet 1 of 1	Attorney Docket Number	IMMR004/01US	

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code ² (if known)		
JD		US 2002/0163498	A1	Chang et al.	11-07-2002
JD		US 2003/0067440	A1	Rank	04-10-2003

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No. ¹	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	T ⁴
		Office ³	Number ⁴	Kind Code ² (if known)			

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OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
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¹ Unique citation designation number.

² See attached Kinds of U.S. Patent Documents.

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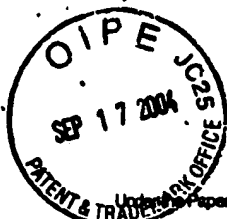
⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

⁶ Applicant is to place a check mark here if English language Translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet **1** of **3**

Complete if Known

Application Number	10/781,818
Filing Date	February 20, 2004
First Named Inventor	Lonny L. Chu
Art Unit	2673
Examiner Name	Unassigned
Attorney Docket Number	IMMR004/01US

U.S. PATENT DOCUMENTS					
Examiner	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code ² (if known)			
JD		6,422,941	7/23/2002	Thomer et al.	
JD		6,180,489	12/12/2000	Perry et al.	
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Examiner Initials ³	Cite No. ¹	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code ³	Number ⁴	Kind Code ⁵ (if known)			
JD		JP	H2-185278		7/19/1990	Taito Corporation	
JD		JP	H4-6381		1/13/1992	Epoch Co. and Key- Planning Co.	
JD		JP	H7-24147		1/27/1995	Sega Corporation	
JD		JP	H5-192449		8/3/1993	Taito Corporation	

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Sheet **2** of **3****Complete if Known**

Application Number	10/781,918
Filing Date	February 20, 2004
First Named Inventor	Lonny L. Chu
Art Unit	2673
Examiner Name	Unassigned
Attorney Docket Number	IMMR004/01US

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

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JD		PATRICK, "Design, Construction, and Testing of a Fingertip Tactile Display for Interaction with Virtual and Remote Environments," <i>Master of Science Thesis</i> , MIT, Aug. 1990, archived Nov. 8, 1990.
JD		CALDER, "Design of A Force-Feedback Touch-Introducing Actuator For Teleoperator Robot Control," <i>Bachelor of Science Thesis</i> , MIT, May 1983, archived June 23, 1983.
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JD		JOHNSON, "Shape-Memory Alloy Tactile Feedback Actuator," <i>Armstrong Aerospace Medical Research Laboratory</i> , AAMRL-TR-90-039, August, 1990.
JD		KONTARINIS et al., "Tactile Display of Vibratory Information in Teleoperation and Virtual Environments," <i>PRESENCE</i> , 4(4):387-402, Harvard Univ., 1995.
JD		AUKSTAKALNIS et al., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-938151-82-7, pp. 129-180, 1992.
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JD		PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 nd Edition; McGraw-Hill, ISBN 0-07-050167-X, pp. 41-202, 1994.
JD		"Cyberman Technical Specification," <i>Logitech Cyberman SWIFT Supplement to Logitech Mouse Technical Reference and Programming Guide</i> , 4/5/1994.
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JD		"Component Maintenance Manual With Illustrated Parts List, Coaxial Control Shaker Part No. C-25502," <i>Safe Flight Instrument Corporation</i> , Revised 28 January 2002 (3 pages).

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Sheet 3

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